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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/CEMENT/2016-17 Date: 13.07.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
*NAME OF THE WORK	:	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	11.07.2016
PERIOD OF TESTING	:	11.07.2016 to 13.07.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	190 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	475 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

Information is furnished by the Customer/Representative.

Note:

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/SAND-Gradation/2016-17 : 13.07.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

* Customer : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

* Agency : **Mr. B.T. Surendra,**
# 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.

* Name of Work : Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 11.07.2016

Date of Testing : 13.07.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	92.52	90-100	90-100	90-100	95-100
2.36	76.98	60-95	75-100	85-100	95-100
1.18	48.52	30-70	55-90	75-100	90-100
600 Micron	22.85	15-34	35-59	60-79	80-100
300 Micron	10.69	5-20	8-30	12-40	15-50
150 Micron	4.45	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/AGG/GR/2016-17 : 13.07.2016

TEST REPORT ON COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
* Name of Work	: Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm)
Sample Received on	: 11.07.2016
Date of Testing	: 13.07.2016

Total Wt. of Aggregates in gms= **7000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Spec.Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	96.53	95-100	85-100
20	33.46	30-70	0-20
10	12.57	10-35	0-5
4.75	1.64	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/CC Solid Block/2016-17 : 16.07.2016

TEST REPORT ON CEMENT CONCRETE SOLID BLOCKS

* Customer	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
* Name of the Work	: Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
Sample Received on	: 11.07.2016
Date of Testing	: 16.07.2016
Size of Blocks	: 400mm x 200mm x 200mm
Cross Sectional Area	: 80000 mm^2
Technical Reference	: IS: 2185 (Part 1) - 2005
No. of Blocks Tested	: 08

Sl.No.	Block ID	Wt. in Kg	Failure load (KN)	Compressive strength (N/mm^2)	Requirement as per IS 2185 (Part 1) - 2005
1	Block 1	34.87	265.7	3.32	Minimum required Compressive Strength of Individual Units 3.20 N/mm^2
2	Block 2	33.92	266.5	3.33	
3	Block 3	32.74	262.5	3.28	
4	Block 4	31.68	263.8	3.30	
5	Block 5	32.53	265.1	3.31	
6	Block 6	33.37	266.5	3.33	
7	Block 7	32.29	261.9	3.27	
8	Block 8	34.46	263.5	3.29	

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Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/CUBE/2016-17 25.08.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
* Name of the work	: Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{15}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 25.08.2016

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	28.07.2016	25.08.2016	8.159	374.8	16.66
2	28.07.2016	25.08.2016	8.247	386.5	17.18
3	28.07.2016	25.08.2016	8.361	403.7	17.94

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/W.No.09/BTS/CSR-07/089e/Precast Slab/2016-17 10.08.2016

CEMENT CONCRETE CORE (PRECAST SLAB) TEST REPORT

* Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
* Name of work	:	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	:	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
Techinical Reference	:	IS:516-1959 (Reaffirmed 2008), SP-24:1983.
Sample ID	:	Precast Slab
Sample Received on	:	05.08.2016
Date of Testing	:	10.08.2016

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	75.00	0.371	2519.32	1.50	0.965	32.0	16.29	17.59	16.97	21.22
2	50.00	76.00	0.380	2546.48	1.52	0.960	32.6	16.58	17.91	17.19	21.49
3	50.00	77.00	0.389	2572.94	1.54	0.955	32.9	16.78	18.12	17.30	21.63

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Job No.: CTCE/BBMP/W.No.09/BTS/WMM/Gradation/2016-17

02.09.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. B.T. Surendra,**
1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.

Name of Work : Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016

Date of Testing : 02.09.2016

Material : WMM

Sample ID : WMM Layer

Oven Dry Wt (gm): **7650**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	275	275	3.6	96.4	95-100
22.4	2535	2810	36.7	63.3	60-80
11.2	1320	4130	54.0	46.0	40-60
4.75	955	5085	66.5	33.5	25-40
2.36	860	5945	77.7	22.3	15-30
0.600	745	6690	87.5	12.5	8-22
0.075	580	7270	95.0	5.0	0-8

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ಸಹಾಯಕ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಭಿಯಂತರರು,
ವಿದ್ಯಾರಣ್ಯಪುರ ಉಪ ವಿಭಾಗ,
ಯಲಹಂಕ ವಲಯ,
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-97.

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Job No.: CTCE/BBMP/W.No.09/BTS/WMM/AIV/2016-17 02.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara; Bangalore - 79.
Name of the Work	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
Sample ID	WMM Layer
Type of Mix	Wet Mix macadam
Date of Testing	02.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	300	
4	Aggregate Impact value = percent fines	21.93	22.48	
	$100^* (W_2/W_1)\%$			**22.21**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.09/BTS/WMM/S-T/2016-17 02.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
Name of Work	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	02.09.2016

Result : Flakiness Index = **11.34%**

Elongation Index = **13.59%**

Result : Combined Flakiness & Elongation index **24.93%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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ಬಿ. ಬಿ. ಎಂ. ಪಿ., ಬೆಂಗಳೂರು-97.

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Job No.: CTCE/BBMP/W.No.09/BTS/BM/Bitumen/2016-17 08.09.2016

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
NAME OF THE WORK	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
SAMPLE I/D	3rd Main Road, Virupakshapura, Ward No. 09.
DATE OF TESTING	08.09.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	482.5	481.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17.5	18.50
7. Bitumen content in %	3.50	3.70
8. Average	**3.60**	

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Job No.: CTCE/BBMP/W.No.09/BTS/BM/Gradation/2016-17

08.09.2016

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
NAME OF THE WORK	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
SAMPLE I/D	3rd Main Road, Virupakshapura, Ward No. 09.
DATE OF TESTING	08.09.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	31.69	6.57	6.57	93.43	90-100
13.2	92.56	19.18	25.75	74.25	56-88
4.75	264.67	54.85	80.61	19.39	16-36
2.36	18.89	3.92	84.52	15.48	4-19
0.3	36.53	7.57	92.09	7.91	2-10
0.075	15.98	3.31	95.40	4.60	0-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	32.87	6.83	6.83	93.17	90-100
13.2	83.46	17.33	24.16	75.84	56-88
4.75	260.37	54.07	78.23	21.77	16-36
2.36	46.79	9.72	87.95	12.05	4-19
0.3	25.58	5.31	93.26	6.74	2-10
0.075	8.45	1.75	95.02	4.98	0-8

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Job No: CTCE/BBMP/W.No.09/BTS/BC/Bitumen/2016-17 09.09.2016

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

AASHTO T 164

CLIENT	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
NAME OF THE WORK	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
SAMPLE I/D	3rd Main Road, Virupakshapura, Ward No. 09.
DATE OF TESTING	09.09.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473.5	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26.5	26.00
7. Bitumen content in %	5.30	5.20
8. Average	**5.25**	

Note:

Þ This test report should not be reproduced except in full, without written approval of the laboratory

Þ The results indicated above are based on the tests carried out on the samples at site

Þ Any Query regarding the report must be reported within 30 days from the date of testing

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M/s. Civil-Tech Consultants & Engineers
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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

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Job No: CTCE/BBMP/W.No.09/BTS/BC/Gradation/2016-17

09.09.2016

BITUMEN GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

AASHTO T 30

CLIENT	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. B.T. Surendra,** # 1606/29, 7th A Cross, 7th Main Road, Govindarajanagara, Bangalore - 79.
NAME OF THE WORK	Improvements and Asphalting to roads at Virupakshapura and surrounding areas in Ward No. 09 in Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/EE/BTP/WO/297/2015-16 Dated: 19.03.2016
SAMPLE I/D	3rd Main Road, Virupakshapura, Ward No. 09.
DATE OF TESTING	09.09.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	42.15	8.90	8.90	91.10	79-100
9.5	36.28	7.66	16.56	83.44	70-88
4.75	73.16	15.45	32.01	67.99	53-71
2.36	66.34	14.01	46.03	53.97	42-58
1.18	51.89	10.96	56.98	43.02	34-48
0.6	63.57	13.43	70.41	29.59	26-38
0.3	43.95	9.28	79.69	20.31	18-28
0.15	32.15	6.79	86.48	13.52	12-20
0.075	34.87	7.36	93.85	6.15	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	38.56	8.14	8.14	91.86	79-100
9.5	47.21	9.96	18.09	81.91	70-88
4.75	72.36	15.27	33.36	66.64	53-71
2.36	59.87	12.63	45.99	54.01	42-58
1.18	72.15	15.22	61.21	38.79	34-48
0.6	40.18	8.48	69.69	30.31	26-38
0.3	42.26	8.92	78.61	21.39	18-28
0.15	37.94	8.00	86.61	13.39	12-20
0.075	32.65	6.89	93.50	6.50	4-10

Note:

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